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AUTHOR	Morris, W. W.
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ABSTRACT

This paper relates the ncn-intellectual characteristics of medical school applicants to subsequent success in medical schocl. The hypctheses investigated were: (1) there is a relaticnship between verbal and quantitative ability and medical school achievement; (2) these ability measures are related to ncn-intellectual as well as intellectual factors; and (3) deviaticns from predicted perfcrmance will be related to non-intellectual factors thus affording clues to better understanding of achievement in terms of needs, temperaments, and value systems of the students. It was found that Verbal Ability and Quantitative Ability Scores cn the Medical Ccllege Admissicn Test (MCAT); medical school cumulative grades; and the deviation of grades from those which would have been predicted by the MCAT scores separately were related to scores on the Edwards Perscnal Preference Schedule, cn the Thurstone Temperament Schedule, and cn the Allport-Vernan-Lindzey Study of Values. Correlation ccefficients tended to be of low magnitude and the ncn-intellectual variables were often quite different from study to study. (RSM/Author)

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DOES THE TRANSCRIPT TELL ENOUGH *

by

W. W. Morris, Ph.D. **

"To succeed at horse racing, one must have horses that not only can, but will, run fast." [1]

In a very real sense this describes the formidable task facing Admissions Committees in the nation's professional and graduate colleges these days. These committees find themselves confronted with a great number of "horses" and it is their task to decide which of these not only can, but will run. It is not unusual nowadays for medical schools, for example, to receive applications for admission from 15 to 20 times as many students as can be offered places in their first year classes. This might not be so serious a problem were it not for the fact that as the number of applicants have increased, the quality of their credentials, as presented in their transcripts and as indicated by their MCAT, GRE, Dental Aptitude and other objective test scores, has also increased steadily. Thus, more than ever, it becomes important to be able to select students who not only can, but will, seek high achievements and reach them. But herein lies the problem which may have stimulated the ideas for this session which asks the question: "Does The Transcript Tell Enough?"

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** Associate Dean, College of Medicine, The University of Iowa, Iowa City, Iowa.

[1] "The Appraisal of Applicants to Medical Schools", "Preface", p.v, Berry, George Packer, M.D. Report of the A.A.M.C. Teaching Institute, 1956.

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As perplexing as it is to identify students of superior intellectual abilities, it is far more difficult to identify students who have in addition characteristics such as the willingness to work persistently, the drive to achieve, proper motivation for a career in the field, the capacity to withstand the anxieties encountered when confronted with emotionally disturbing situations, and the many other non-intellectual factors which might reduce an otherwise promising student to an under-achiever, a dropout or a failure. These are questions which have challenged admissions committees and psychologists for many years. The answers do not appear on the transcripts, so we may conclude right now that the transcript does not tell enough.

From time to time sporadic and occasionally concerted attacks have been mounted to attempt to solve some of these problems, but it is a difficult area in which to work and so far, at least, there have been few successes. The Association of American Medical Colleges through its Divisions on Student Affairs and on Educational Measurement and Research has invested much in this effort for over fifteen years.

Recently, in discussing the AAMC Longitudinal Study, Dr. Jack Hutton, Assistant Director, Division of Educational Measurement and Research, reported from association records:

> "And in the affective domain: What are the interest and personality patterns of those who select a career in medicine? Are there ascertainable differences in these patterns that characterize those who choose to enter the different specialties or those who graduate from different schools? Would some of the students who are now lost to medicine through withdrawal or failure have been successful at another medical school with

different fellow students, teachers, traditions, and philosophy? What about the students who are discouraged from or are never attracted to medicine: Are we losing some we might prefer as representatives of the profession, as opposed to some we are now selecting? How can we identify such intangible qualities as integrity and social responsibility that are so important in the practice of medicine?

Many of these questions are still relevant today, and some remain unanswered. It was hoped that inter-institutional research, basically longitudinal in nature, would help to answer them. Therefore, 28 medical schools were selected to participate in the study, and, in the Fall of 1956, each of these 28 schools administered a battery of tests to their entering freshmen. Twenty-one of the schools also had administered the same tests to their seniors the previous Spring, so that ultimately it was to become possible to make both cross-sectional and longitudinal analyses of relationships between measured characteristics of students and progress through four years of medical education.

"The initial test battery consisted of the Allport-Vernon-Lindzey Study of Values, the Edwards Personal Preference Schedule, and the Strong Vocational Interest Blank for Men. Additionally, information on career plans was collected from the 1955-56 seniors at the 21 schools, while biographical data were obtained on the 1956-57 freshmen at all 28 schools. Scores on the Medical College Admission Test were also available for most of the subjects.

"One of the first analyses of AAMC Longitudinal Study data involved a look at the relationship between performance in medical school and amount of

undergraduate education prior to entrance. Results of the analysis indicated that nearly all of the variation in course marks that appeared to be associated with amount of undergraduate education could be accounted for by variations in ability as measured by the Medical College Admission Test.

"....a rather sweeping generalization, well-supported by the data suggests that there are vast differences across medical schools in student characteristics and in the learning environment that account for most of the variance in the immediate and intermediate criterion measures studied. In other words, different schools attract different types of students, have different educational environments that produce different kinds and amounts of student change, and produce different types of graduates. If any one thing can be singled out as making "the" difference in what kind of new M.D. is produced, it would have to be the characteristics of the medical school itself; and most of these characteristics have been found to be related to financial resources."

Well now - since the early 1930's psychologists have been developing, studying, publishing and writing about tests, inventories, schedules, and interview techniques which purport to measure, estimate, or describe some of the important non-intellectual characteristics of applicants and how they relate to subsequent achievement in the professional college.

I have conducted a number of studies attempting to use these types of instruments to predict the performance of students in Medical School. A brief resume of one such study follows:

In this study, Verbal Ability and Quantitative Ability Scores on the Medical College Admission Test; medical school cumulative grades at the end of the first,

second and fourth years; and the deviations of grades from those which would have been predicted by the two MCAT scores separately were related to 17 scores on the Edwards Personal Preference Schedule (EPPS), 7 scores on the Thurstone Temperament Schedule (TTS), and 6 scores on the Allport-Vernon-Lindzey Study of Values (AVL).

The hypotheses under consideration were:

1. That there is a relationship between verbal and quantitative ability and medical school achievement;
2. That these ability measures are related to the non-intellectual scores;
3. That achievement in medical school is related to non-intellectual as well as intellectual factors; and
4. That deviations from predicted performance will be related to non-intellectual factors thus affording clues to a better understanding of over-, under-, and consistent-achievers in terms of the "needs", "temperaments", and "value systems" of the students.

The results of the analyses designed to examine these hypotheses were as follows:

1. Need-exhibition and need-autonomy of the 17 Edwards Personal Preference Schedule variables were significantly positively related to achievement in medical school. Need-achievement yielded a low positive correlation with actual achievement at the end of the first and second years and reached a correlation significant at the 5 per cent level with the students at the end of four years of medical school.

2. There were no significant relationships between the Thurstone Temperament Schedule variables and achievement, although the "Sociable" factor was consistently negatively correlated with achievement.

3. On the Allport-Vernon-Lindzey Study of Values, the "Aesthetic" value score correlated positively and the "Religion" value score correlated negatively with achievement.

4. Medical College Admissions Test Verbal Ability "Deviation" scores produced only one set of significant correlations with the non-intellectual factors. This was a negative correlation with the Thurstone Temperament Schedule "Reflective" scale. This suggests that as actual medical grades deviate from predicted grades, there is a reverse relationship with the Thurstone Temperament Schedule "Reflective" score. Thus, over-achieving tends to be related to the type of person who likes to deal with particular problems while the under-achieving person tends to "like meditative and reflective thinking and enjoys dealing with theoretical rather than practical problems".

5. Grades deviating from predictions based on Quantitative Ability scores were positively related to the Edwards Personal Preference Schedule "Need-Exhibition" scale and to the Allport-Vernon-Lindzey "Theoretical" value scale. These findings suggest that grades deviate toward "over-achievement" in persons who "like to say witty and clever things, tell amusing jokes and stories,... to be the center of attention,... etc. They also suggest a positive

relationship with scores which characterize people whose interests "are empirical, critical and rational - whose chief aim in life is to order and systematize his knowledge".

From the foregoing it would appear that there are indeed the kinds of relationships we were looking for between academic performance and non-intellectual variables. Still two important matters must be noted. First, while the correlation coefficients mentioned above were significantly greater than zero, they tended in general to be of a rather low magnitude (the highest being .44 and the lowest being in the mid twenties). The coefficients of determination tend to be in the neighborhood of 6%, signifying that 94% of the variance between the two variables is unaccounted for. Thus, while the correlation coefficients suggest some significant group relationships, too heavy a proportion of variance is undetermined to give one any feeling of confidence in applying these findings to individual cases.

Second, while reports in the literature of similar studies and other studies of my own occasionally report similar findings, the non-intellectual variables are often quite different both from author to author and from study to study. For example, in a previous study using the Thurstone Temperament Schedule, I found significant relationships between academic achievement in medical school and Thurstone's Active and Vigorous factors. However, in the present study no such relationships were found. Again, the ephemeral nature of such findings does not give one any feeling of confidence about applying them to individual applicants.

These seemed like promising approaches. Why did they not succeed?

One variable which might account for this lack of success relates to the attitudes of applicant students. Applicants to medical school, or to any other school or job, come with a particular "set" to achieve acceptance. One must presume, therefore, that their behavior will be conditioned by this "set".

e.g., positive "set" to be admitted, to get the $50,000 a year job, to be promoted.
e.g., negative "set" to be rejected (say from the armed forces), to fail to prove a point (such as the student "pushed into" a school situation more or less against his will, etc).

Much of this behavior is unconscious and often is the result of long-term, subtle influences of which the student may not even be aware. (e.g., basis of his motivation for medicine may not be in his awareness and may never have been verbalized; parents may have exerted subtle pressures over many years without the student's ever having questioned it or been aware of it: e.g., some students, by virtue of their family backgrounds, "never thought of not going to college" while ghetto students and others may never have thought of going -- since these are statements of "absences" or omissions, the concept frequently never enters consciousness).

Student behavior, therefore, during interviews or while taking personality tests, is colored by these unconscious forces and we may, more often than not, find ourselves asking questions which the student cannot answer truthfully because he doesn't know the truth (this is, in effect, an operational definition of unconsciousness). Nevertheless, we do ask the question and he feels compelled to answer. His answer is predictably in the direction of his "set".

E.g.'s from testing and from interviewing. The problem of the "leading question". From the Cornell Selectee Index: "Have you ever received a severe blow on the head?"; "Do you ever have headaches?"; etc. Discuss answers of recruits who do or do not want to be in the Navy. In interest inventories or adjustment inventories, it is consciously possible and easy to "throw" the results in any desired direction.

In interviews, leading questions frequently result in the interviewer reporting what he, the interviewer, "wanted to discover" and this may or may not be relevant to the student's basic interests or motivations. Thus, there is a remarkable difference between the questions: "What is there about medicine that attracts your interest; what makes you believe it will be a satisfying and rewarding career for you?" and "Did you choose medicine because you wanted to take care of sick people; do you believe that caring for the sick and injured and infirm will be rewarding and satisfying to you?" These questions illustrate another principle of interviewing: that of the "Yes-No" type of question which usually leads exactly to a "Yes-No" answer.

Now how does one "get around" these problems? Psychologists have devised some interesting and devious techniques -- some of which are very promising, but most of which are not yet perfected to the point of great reliability and/or validity -- which questions must always be answered before techniques are adopted for actual use. (Describe projective techniques and forced-choice inventories.)

In the interview situation "forced choice" is not possible, but the principles of projective techniques may be useful, and a modified "forcing" approach is something I have found both useful and revealing.

Basic principles: Open-ended questions, questions designed to get the subject to free-associate about a topic, the "correct" answers to which are not at all clear to him and "forcing" more and more definitive answers.

But the data on interviewing in general is largely negative. This, however, it should be noted, relates to interviewing as a "predictive" technique. If interviewing is regarded as information gathering, information giving, counselling, observing, and as a public relations activity, it is my opinion that it is a very worthwhile, valuable and productive part of the admissions program.

Another important factor contributing to the lack of success in finding useable relationships between academic performance and non-intellectual variables is related to the present and continuing lack of sophistication in the psychological instruments themselves. By this I refer to the fact that our present instruments "measure" whatever they purport to measure so grossly that one should not be too surprised at their lack of utility.

Still, since we are convinced that the transcript does not tell enough and that there must be important non-intellectual variables which play a significant role in academic performances, then we must continue to seek these relationships and refine our methods to enhance the possibility of success. The promising work on structured biographical inventories and their use in attempting to increase the predictability of a variety of performance criteria which is being conducted by Dr. Robert Ellison and Dr. Calvin Taylor and their colleagues at the University of Utah gives us reason to hope.

I believe at least one of the keys to possible future success which makes the effort worthwhile lies in an approach which might be thought of as the "known groups approach". As a matter of fact, this might also be the bridge that could eventually help in solving another knotty problem; i.e., the identification and establishment of criteria of the "good" doctor, dentist, nurse, etc.

Approximately two years ago, at the suggestion of the Medical College Admission Test Advisory Committee, the AAMC's Division of Educational Measurement and Research established a standing Committee on the Measurement of Personality (COMP). The purpose of the new committee was to explore the area of personality measurement and its relation to the selection, training, and evaluation of medical students.

Recently, COMP decided to sponsor an invitational conference on the topic of personality measurement in medical education. Conference leaders and discussion groups will be asked to focus on noncognitive, affective-domain factors in (a) the selection of medical students and (b) the prediction of career criteria with emphasis upon clinical performance. It is hoped that the conference will accomplish three major objectives:

1. To stimulate interest in the areas mentioned above among medical educators.

2. To stimulate the thinking of COMP members and other interested medical educators by providing them with up-to-date input from individuals working at the frontiers of personality theory and measurement.

3. To open avenues of communication between and among COMP members and other medical educators.

We look forward to the proceedings of this conference with much anticipation since out of such a conference may well come the designs for the necessary research which will provide us with the reliable and valid techniques we need.

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